ARCHAEO + MALACOLOGY GROUP NEWSLETTER

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Welcome to issue 28 of the AMWG newsletter! This summer issue includes details on forthcoming meetings and conferences, short reports, abstracts and an exciting opportunity for AMWG members to purchase the recently published *Molluscs in Archaeology* at a discounted rate. I want to thank Oxbow Books and Dr. Mike Allen for the 20% special discount to AMWG members, valid until 31st October. This new book published in the summer encompasses the analysis of land and marine shells with 26 expert contributors, many of whom are members the archaeomalacology working group. Book details and the order form can be found on page 16 and 18.

About the Newsletter

The Archaeo + Malacology Newsletter warmly invites contributions related to archaeomalacology in its widest sense. Please email submissions and questions to the editor. **Annual deadlines are 31st January for circulation in February and 31st July for circulation in August**. Current and previous issues of the newsletter are available at archaeomalacology.com.

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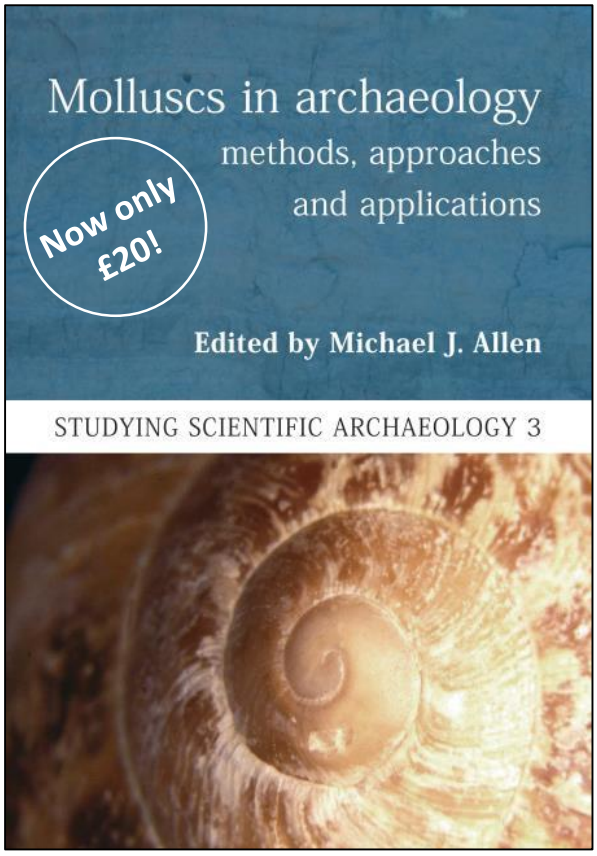

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Short Reports

Shell beads in Neolithic sites in Turkey

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Shells of molluscs are the most ancient materials known to have served as beads by prehistoric people. People in the past, like today, used three types of molluscs to adorn themselves: Gastropods (snails), bivalves and scaphopods (tusk shells). The earliest examples are known from Mt. Carmel Caves in Israel, from a few sites in Morocco, and from South Africa. People started decorating themselves at around 100,000 years ago in these regions, as part of the cognitive evolution of modern *Homo sapiens*. The earliest shell beads in the Palaeolithic period were made

of a small selection of shell species, especially *Nassarius* and *Glycymeris*, but as time progressed, the species collected for this purpose became more diverse.

In Turkey, the Early Upper Palaeolithic (ca. 45,000 to 30,000 years ago) cave site of Üçağızlı in the Hatay yielded a very large shell assemblage consisting of hundreds of shell beads, especially the Mediterranean gastropods, *Columbella rustica* and *Nassarius gibbosulus*, most of which were perforated (Stiner *et al*., 2013). Slightly later, at Öküzini in southern Anatolia, the use of similar shells continues, but *Dentalium* or tusk shell, a tube-like shell is also found (Albrecht *et al*., 1992). It is not surprising, then, that these shells are also found in later sites. Here I discuss shell assemblages that date to the Neolithic period, the time when people in the Middle East change their economic basis from a lifestyle of hunters and gatherers to that of farmers. They domesticated wheat, barley and legumes, they settled in permanent villages, and later they also domesticated sheep and goat, as well as pigs and cattle.

Just before the beginning of the "Neolithisation" process, at the site of Pinarbasi, tusk shells covered with ochre and some *Nassarius* were found in a grave (Baird *et al*., 2013). Tusk shells (scaphopods of the genus *Dentalium* or *Antalis*) were very common in Natufian sites in the Levant (about 15-11,500 years ago) that are from about the same time period, and there too, they were often associated with burials (Bar-Yosef Mayer, 2008). Later, in the Levant, in the Early Neolithic period (ca. 11,500-8,000 years ago), we see a change in the species diversity of mollusc shells, with more shells belonging to *Glycymeris*, several species in the family Cardiidae, and cowries. In Turkey, at the same time, there seem to be two trends: Sites in Anatolia, even though they are permanently settled villages, continue the Palaeolithic tradition of shell selection. Their inhabitants adorn themselves with *Nassarius*, *Columbella* and tusk shells, and there are only very rare cases of other species like the ones used in the Levant. This is the case for Boncuklu Höyük (Baysal, 2013) and at Çatalhöyük, where over 900 shells were made into artifacts, 430 of which were made of marine shells from the shores of the Mediterranean Sea. From this group, the species of *Columbella rustica*, *Nassarius gibbosulus*, *Conus mediterraneus*, and *Antalis* spp. form approximately 97% of the marine shell assemblage (Fig. 1 and 2). The small number of other marine shells, belonging to the Cypraeidae family (cowries) and *Cerastroderma glaucum,* hint at the possibility of sporadic contact with populations to the East who used these species more commonly (Bar-Yosef Mayer, 2013).

Indeed, in the Southeast of Turkey, at the Neolithic site of Çayönü (Erim Özdoğan, 2011) most of the shell assemblage was composed of freshwater shells from the near-by river, mostly *Theodoxus* and *Melanopsis* snails,

Fig. 1: *Nassarius gibbosulus* shell beads from Çatalhöyük. Photo credit: Çatalhöyük research project.

Fig. 2: *Columbella rustica* shell beads from Çatalhöyük. Photo credit: Çatalhöyük research project and Burçin Gümüs.

and *Unio* bivalves. The latter were probably collected to be eaten. However, we can infer important information from the marine shells found at Çayönü: *Columbella*, *Nassarius*, *Conus* and tusk shells are present in modest numbers, whereas other species, such as cowries, *Glycymeris* and cardiid shells are more common, especially in the Pre-Pottery Neolithic B occupation phases of the site (ca. 10,800-8400 years ago). This occupation phase corresponds to the occupation of Çatalhöyük and Boncuklu Höyük in Anatolia. Of note is that some of the cowries are species from the Red Sea (Fig. 3), and not only from the Mediterranean.

Interestingly, relatively many of the cowries and *Glycymeris* at Çayönü had double perforations, indicating that the beads were sewn onto clothes (or some other material), rather than just suspended as a necklace. The fact that Çayönü is situated near the sources of the Tigris River may well explain its ties to sites in other parts of the Fertile Crescent and the Levant, in that people were able to navigate up and down the river (Bar-Yosef, 2013). This means that Çayönü, due to its geographic location, probably had stronger cultural ties with the Levantine

Fig. 3: *Erosaria nebrites* from the Red Sea found at Çayönü. Photo: Daniella Bar-Yosef.

Fig. 4: Fossil *Dentalium* sp. from Çatalhöyük, with a worn-down bead from the same species. Photo credit: Çatalhöyük research project.

Fig. 5: Pendants made of the freshwater *Unio* sp. found in a burial at Çatalhöyük. Photo credit: Çatalhöyük research project.

world (that reaches as far south as the Red Sea), than communities in southern Turkey. However, not only marine shells were used for making ornaments at Çatalhöyük. Shells were also collected from fossil beds in the Taurus Mountains, and from various freshwater sources nearer to the site of Çayönü. Of special interest are *Dentalium* shells from Pliocene deposits of the Hatay-Samandağ and İskenderun basins, which are at a distance of over 300 km from Çatalhöyük (Bar-Yosef Mayer *et al*., 2010; Fig. 4). *Dentalium* shells were extremely popular at Çatalhöyük, and account for 300 shell beads recovered at the site, most of which were cut into short shell rings, just a few mm long, and very weathered from use.

Another source of shell beads are local bivalves. Most commonly, shells belonging to the bivalve *Unio* sp., were collected and made into pendants, very often with a rectangular or squarish shape, and two holes drilled in them for suspension or in order to be sewn onto clothes. Of special interest is a concentration of 13 pendants from Çatalhöyük: the rounded square shaped shells are especially thin (ca. 1 mm), and have two perforations each (Fig. 5). A microscopic examination of the holes indicates that they are not worn, neither were they sewn, suggesting their possible production to serve as grave goods for the infant in whose burial they were found. Because *Unio* shells are very common throughout Turkey, and the interior of the valves have the quality of mother-of-pearl, pendants were frequently made of them from the Neolithic onwards, and their shiny white appearance was probably significant. At Çayönü as well, there were about 10 artifacts made of *Unio* shell, most of them were pendants in various shapes, and here too, some had double perforations

Conclusions

Mollusc shells, since their first use in the Palaeolithic, were used by people as personal ornaments, but also for various social purposes, and possibly as a means of communication (Kuhn, 2014). Shells were included in spiritual practices, such as placing shells in graves, demonstrating that people valued them as amulets which had a special meaning, like protection against the 'evil eye', and of course, also as simple beads for their aesthetic merit. Beyond their actual use, shells in archaeological sites contribute to our understanding of the economy of past societies, in that shells were probably exchanged for other items or food, and sometimes traded over long distances.

Acknowledgements

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References

Albrecht, G., Albrecht, B., Berke, H., Burger, D., Moser, J., Rähle, W., Schoch, W., Stroch, G., Uerpmann, H. P. and Urban,

B. 1992. Late Pleistocene and Early Holocene Finds from Öküzini: A Contribution to the Settlement History of the Bay of Antalya, Turkey. *Paléorient 18/2:123-41*.

Baird, D., Asouti, E., Astruc, L., Baysal, A., Baysal, E., Carruthers, D., Fairbairn, A., Kabukcu, C., Jenkins, E., Lorentz, K., Middleton, C., Pearson, J. and Pirie, A. 2013. Juniper smoke, skulls and wolves' tails. The Epipalaeolithic of the Anatolian plateau in its South-west Asian context; insights from Pınarbasi. Levant 2013 VOL 45 NO 2 175 45:175-209.

Bar-Yosef, O. 2013. The Homelands of the Cyprus Colonizers: Selected Comments. *Eurasian Prehistory 10:67-82*.

Bar-Yosef Mayer, D. E. 2013. "Mollusc Exploitation at Çatalhöyük," in *Humans and landscapes of Çatalhöyük: reports from the 2000-2008 seasons*. Edited by I. Hodder, 329-38. Los Angeles: Çatalhöyük research project Volume 8. Cotsen Institute of Archaeology Press.

Bar-Yosef Mayer, D. E. 2008. Dentalium Shells Used by Hunter-Gatherers and Pastoralists in the Levant. *Archaeofauna 17:103-10.*

Bar-Yosef Mayer, D. E., Gümüş, B. A. and İslamoğlu, Y. 2010. Fossil hunting in the Neolithic: shells from the Taurus Mountains at Çatalhöyük, Turkey. *Geoarchaeology 25:375-92*.

Baysal, E. 2013. A tale of two assemblages: Early Neolithic manufacture and use of beads in the Konya plain. *Anatolian Studies 63:1-15.*

Erim-Özdoğan, A. 2011. "Çayönü," in *The Neolithic in Turkey: New Excavations and New Research, The Tigris Basin*. Edited by M. Özdoğan, N. Başgelen and P. Kuniholm, 185-269. Istanbul: Archaeology and Art Publications.

Kuhn, S. L. 2014. Signaling theory and technologies of communication in the Paleolithic*. Biological Theory 9:42-50*.

Stiner, M. C., Kuhn, S. L. and Gülec, E. 2013. Early Upper Paleolithic shell beads at Üçagızlı Cave I (Turkey): Technology and the socioeconomic context of ornament life-histories. *Journal of Human Evolution 64:380-98*.

Ancient shell working revealed at Agroha, Haryana state in Northern India

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Abstract

Shell objects recovered from archaeological sites in Northern India have been relatively less studied as compared to those from Peninsular India. The recent observations on a surface collection of shell objects from Agroha in Haryana state revealed an ancient shell industry of the Early Historic period. Presence of sawn shell fragments of the large marine gastropod *Turbinella pyrum* indicate that it was solely used for manufacturing shell objects such as bangles, beads and small miscellaneous objects. Of interest are the small animals like tortoise, lion, swan and frog made using this shell. While more detailed insights could not be inferred due to their lack of stratigraphic context, these were useful in providing evidence for this ancient craft activity in Northern India which otherwise till date has been scarce.

Introduction

In Northern India, use of shell objects which was introduced during the Harappan civilization is found to continue during the succeeding cultural periods like the Painted Grey ware, Early Historic and Historic. Most commonly used objects were bangles and beads at sites such as Rang Mahal (Ghosh, 1989), Daulatpur (IAR1968-69, 77-78) and Sanghol (Margabandhu, 2015). However, relatively very little is known about their shell working aspects due to the lack of detailed studies as compared to those from Peninsular India (Deshpande-Mukjherjee, 2006 and 2008). Besides Sanghol in Punjab, this particular craft activity has been identified at very few early Historic sites in northern India. Recently a collection of shell objects from the archaeological site of Agroha, district Hissar, Haryana state were examined at the Haryana Pranitya Puratatva Sangrahalya (Museum) Gurukul at Jhajjar in Haryana. These were collected from the surface of the ancient mound at Agroha along with other antiquities like ceramics, beads, terracotta animal and human figurines. Of considerable importance are the terracotta human and animal figurines (Devikiran, 2008). The shell objects were interesting since until to date very few sites in Northern India have yielded such rich finds. Hence, it was felt necessary to take a note of them. Here are discussed the observations made on these shell objects whose exact chronology is uncertain. These are tentatively dated to the Early Historic period on the basis of the associated ceramics, terracotta figurines and comparison with shell objects from other Early Historic sites in Peninsular India.

Agroha located on the Hissar Fathebad road around 22 km from the town of Hissar in the Haryana state of northern India was first excavated by C.J. Rodgers in 1888-89 and subsequently by Srivastava in 1938-39. The excavations revealed a fortified settlement having a continuous habitation from 4th century BC to 14th century AD. A hoard of 4 Greek coins, one punch marked and fifty one coins of Agadaka were recovered along with assorted objects like those of copper, shell bangles, beads, terracotta figurines of bulls, horses and stone sculptures (Srivastava, 1952). From this early excavations no other shell objects were reported, apart from the shell bangles (IAR 1978-79, 79-80). Whereas the surface collection yielded shell beads, bangles, shells, miscellaneous shell objects and shell debitage.

Shell Bangles

Both plain and decorated shell bangles ranging in width from 4 to 15mm were observed. These were made using the large marine gastropod *Turbinella pyrum*, whose shell was commonly used since the Harappan period for making various shell objects. The decorated motifs commonly recorded are channeled, incised lines, floral, central knob and multiple grooves (Fig. 1). One interesting motif is of the conch shell *Turbinella pyrum* on two bangle fragments which is not commonly reported on shell bangles of the Early Historical period, however it was observed at the Early Historic site of Sarangpur in Central India (personal observation) (Fig.2). A few fragments have copper rivets on them indicating that fragments had been joined together to be reused again (Fig. 3). Copper riveting has been observed on Early Historic bangles from Maheshwar, Prakash Nasik in central and western India (Deshpande-Mukherjee, 2008).

Shell Beads

These occur in a variety of shapes such as circular, cylindrical and flat disc, and were made from *Turbinella pyrum* shells. Use of whole shells for making beads is seen from two *Nerita* sp. shells that are perforated at their apex. Four small gastropod shells of marine origin not yet identified were observed with their apex sawn (Fig. 4).

Miscellaneous Shell Objects

Small shell objects in the shape of animals, stars and geometrical shapes were observed. The animals depicted are swan, tortoise, lion and frog (Fig. 5). A fine example of shell craftsmanship is a flat shell object in the form of a swan (Fig.6), and a square shell piece with an engraving of a lion in a crouching position (Devikiron, 2008).

Cowries

A few cowries are also present in the collection. Two varieties were identified; *Moneta moneta* and *Cypraea annulus*. While the latter are complete, the *Moneta moneta* shells occur with their dorsum sawn (Fig. 4).

Shell Debitage

Also observed in the assemblage are sawn shell fragments of *Turbinella pyrum* such as columella, unfinished shell circlets, fragments from the main whorl, lip portion and small chips (Fig. 7).

Discussion

Due to the rich agricultural activities in the Haryana region, most archaeological sites are fast disappearing. Hence the surface collection of the shell objects from Agroha is significant in showing their manufacture and use by the site inhabitants which the excavations could

Fig. 1: Decorated shell bangles from Agroha.

Fig. 2: Shell bangle fragments with conch shell motif.

Fig. 3: Bangle fragments with copper rivets.

not. As revealed from its excavations and location on the ancient trade route between Taxila and Mathura, Agroha had not only served as an important center of commerce but was also involved in various craft activities such as manufacture of terracotta figurines, stone bead making and shell working. The latter is indicated by both the shell debitage and shell objects, however, its intensity is difficult to estimate from the surface finds alone.

The shell evidence indicates the use of the large marine gastropod *Turbinella pyrum* as the chief raw material. The shells were procured from a long distance as far as the

Fig. 4: Cowries and perforated marine shells.

Fig. 5: Miniature animal figures in shell.

Fig. 6: Swan shaped shell object.

Fig. 7: *Turbinella pyrum* shell debitage.

Gulf of Kachchh which is its nearest probable source. Whether complete or partially sawn shells were procured cannot be learnt from the available shell evidence. However, the process of shell working was fairly similar to the one recorded in the Harappan context (Kenoyer, 1984; Deshpande-Mukherjee, 2006) and had mainly focused on the manufacture of bangles. In addition, the resulting shell debitage was further made into beads and small miscellaneous objects. These probably were in demand since they had a certain amount of socio-religious significance attached to them, especially those of animals such as the swan, tortoise and lion. Similar animal objects were recorded at Taxila by H.C. Beck (Beck, 1941). Since the Early Historic period, advent of Buddhism in this region had promoted the use of these shell objects. At Agroha the remains of a Buddhist stupa were identified from the excavations at the site (Srivastava, 1952). During this period the conch shell *Turbinella pyrum* had also acquired an important role in religious rituals and was represented by imitation conches made in terracotta at sites like Sanghol (Margbandhu, 2015) and Piprahwa (IAR 1976-77). The presence of four small shells with their apex sawn belonging to an unidentified marine gastropod probably were meant to substitute *Turbinella pyrum* shells which were difficult to obtain.

Shell bangles, even though fairly common, had a certain amount of economic and symbolic value attached to them due to being reused even after breakage, by joining the fragments using iron rivets. A similar practice has been observed in central India at Early Historic sites like Maheshwar and Prakashe.

Cowries commonly reported from some of the sites ranging from the Early Historic to the Medieval period in Peninsular India were used even at Agroha where the *Moneta moneta* shells with their dorsum sawn may have served as a currency or for exchange.

To conclude, the brief study has helped to not only get an insight into the nature of shell working at the ancient settlement but also provided appreciable evidence for this craft activity during the Early Historic times in Northern India.

Acknowledgements

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References

Beck, H. C. 1941.*The Beads from Taxila*. Memoirs of the Archaeological Survey of India 65, Delhi.

Deshpande-Mukherjee, A. 2006-07. Marine molluscs at ancient settlements in the Deccan. *Bulletin of the Deccan*

College Post Graduate and Research Institute. Vol. 66-67: 262-283.

Deshpande-Mukherjee, A. 2006.Reconstructing the past: Ethnographic Observations on Shellworking at Bishnupur. In: Gautam, S., Royychoudhury, S. and Som, S. (eds). *Past and Present Ethnoarchaeology in India*. Pragati Publications, New Delhi: 383-409.

Deshpande-Mukherjee, A. 2008.Archaeomalacological Research in India with Special Reference to the Early Historic Exploitation of the Sacred Conch Shell *Turbinella pyrum* in the Western Deccan. In Andrez Antczak and Robert Ciprani (eds). *Early Human Impact on Megamolluscs:* BAR British Archaeological Series, Oxford: 209-222.

Devkarin, V. 2008. AgrohakiMurtiya (in Hindi) Haryana Pranitya Puratatva Sangrahalya (Museum) Gurukul, Jhajjar.

Ghosh, A. 1989. *An Encyclopedia of Indian Archaeology*. New Delhi: Munshi Manoharlal.

Indian Archaeology a Review: 1968-69, 77-78

Indian Archaeology a Review: 1976-77

Indian Archaeology a Review: 1978-79, 79-80

Kenoyer, J.M. 1984. Shell working Industries of the Indus Civilisation: A summary, *Palaeorient 10 (1), pp. 49-63.*

Margbandhu, C. and Pandey, P.K. 2015.Excavations at Sanghol. Archaeological Survey of India

Rodgers, C.J. 1888-89. Report of the Punjab Circle of the archaeological survey of 1888-89.

Srivastava, H.L. 1952. Excavation at Agroha, Punjab. Memoirs of the Archaeological Survey of India No: 61.

Papers

Identification of Shell net sinkers or net weights at Kotada Bhadli, Dist. Kachchh, Gujarat. A rarely reported object from the Harappan Civilisation

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Abstract

During the Harappan civilisation a variety of shell objects made from the large marine gastropods were commonly used across the Indus valley and adjoining areas. For the Harappans these were not just for personal adornment but also had served a utilitarian purpose. Among the frequently recovered items, such as bangles, beads and inlays there is negligible reporting of shell net sinkers or net weights. Here we report shell objects identified as net sinkers from Kotada Bhadli, a late Mature Harappan site located in Nakatrana taluka of Kachchh district, Gujarat. As these have not been previously reported from other Harappan sites, their identification was inferred through comparison with notched or grooved stones commonly identified as net sinkers from archaeological contexts world over.

Introduction

Archaeological shell evidence from across the Indus Valley and its adjoining areas indicates the widespread use of shell objects during the Harappan civilisation (Kenoyer, 1984; Deshpande-Mukherjee, 1998). Produced mainly from large marine gastropod shells like *Turbinella pyrum*, their use ranged from personal adornment to that of a utilitarian one. Among the frequently recovered items, such as bangles, beads and inlays, there is negligible reporting of shell net sinkers or fish hooks. Here we report on shell objects identified as net sinkers or net weights from the excavated Late Mature Harappan site of Kotada Bhadli, located in Nakatrana taluka of Kachchh district, Gujarat. Such objects have not been previously reported in the Harappan context, hence an attempt was made to identify them.

Kotada Bhadli (lat. 23° 20' N, Long. 69° 25' E) is located in the Nakatrana taluka of Kachhch district, Gujarat, close to the great Rann of Kachchh (Fig. 1). The excavations between 2010-2014 revealed a fortified settlement surrounding residential structures (Fig. 2). Based on its ceramic evidence, Kotada Bhadli is identified as a single culture site, belonging to the late Mature Harappan period i.e. 2300-2100 BC (Shirwalkar, 2012; Shirwalkar and Rawat, 2012). Kotada Bhadli is a relatively small settlement compared to its neighbouring large urban sites like Dholavira, Juni Kuran or Khirsara, and lacking in their classic Harappan attributes, thus it is considered to be a rural Harappan settlement. Its excavated cultural material included mainly ceramics and antiquities such as beads, objects of copper, stone, bone and shell (Shirwalkar, 2012; Ruikar *et al.,*2013).

Shell objects and other shell remains from Kotada Bhadli

The shell objects found at Kotada Bhadli, were few in comparison to the above mentioned sites, and comprised of bangles (n=18), perforated shells (n=7) and worked columella (n=7). Most commonly occurring are plain shell bangles made from *Turbinella pyrum,* some of which bearing the characteristic Harappan 'V' shaped chevron motif (Fig.3). However very little evidence for their manufacture was recovered, except for one *T. pyrum* shell with a part of main whorl broken and measuring 76.46mm in length, and two sawn columella. Three

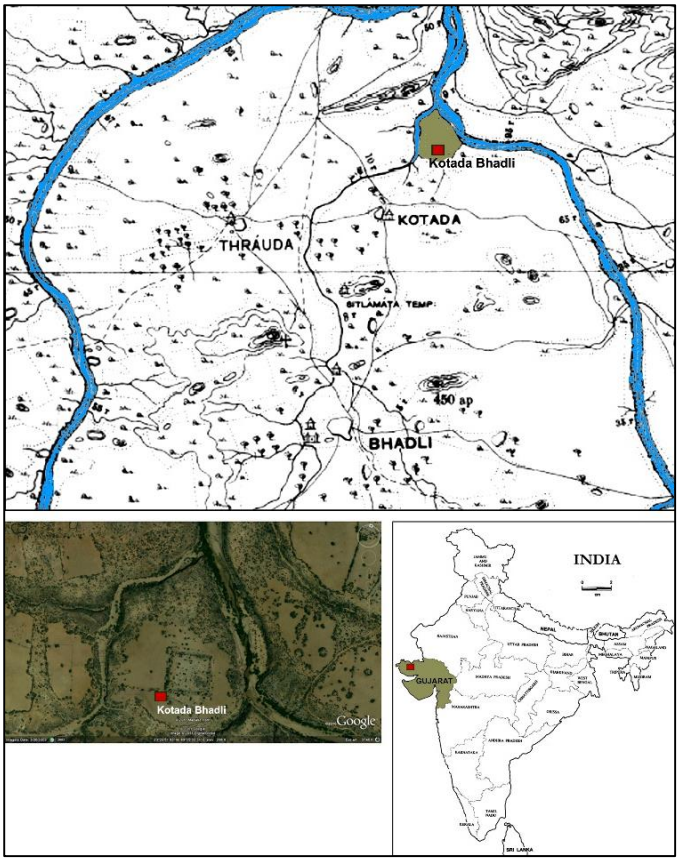

Fig. 1: Site of Kotada Bhadli

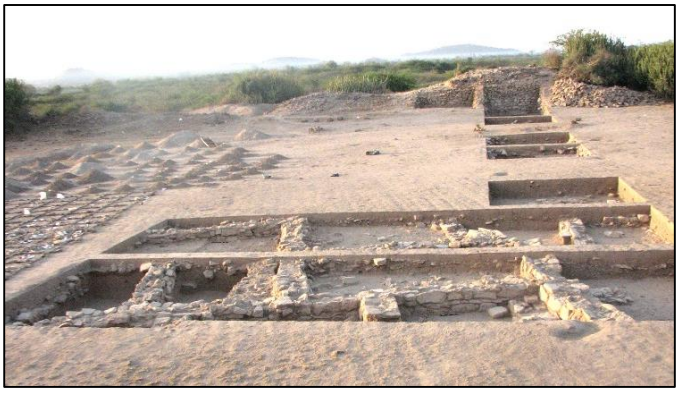

Fig. 2: A view of the excavated site of Kotada Bhadli

Fig. 3: Shell bangles from Kotada Bhadli.

perforated shells of *Oliva*, *Nerita* and *Anadara* along with *Dentalium* sp. were used as beads and pendants (Fig.4). Similar perforated shells are also reported from other Harappan site such as Kuntasi (Deshpande, 1996) and Padri (Deshpande-Mukherjee and Shinde, 2014).

Worked *T.pyrum* columellae

A total of n=7 *T. pyrum* columellae were recovered as isolated finds from different residential structures at the site, and in association with pottery, animal bones, etc. (Fig.5; Table 1). The columella constitutes the solid hard central part of the *T. pyrum* shell having transverse external grooves. It is detached from the main shell whorl during shell cutting for the manufacture of bangles. From their size, it is noted that the columellae obtained were from medium to large sized shells. The external thick transverse grooves have been abraded or smoothened down to obtain a cylindrical shaped object which is broad in the centre and tapering towards both ends that are rounded and flattened. The columellar surface is fairly well polished, and its longer axis bears a shallow notch or a u-shaped groove on either sides of its centre or waist. On some shells the notch extends all around the breadth of the columella as a broad shallow groove (Fig. 5).

Besides shell objects, broken molluscan shells were also recovered whose taxonomic identification indicated the presence of 11 taxa of marine and estuarine origin. The following molluscs were identified; Gastropods: *Turbinella pyrum*, *Tonna* sp., *Telescopium telescopium*, *Terebralia palustris*, *Conus* sp., *Nerita* sp., *Oliva* sp., *Cypraea* sp. and *Umbonium*. Bivalves: *Anadara* sp. and *Paphia gallus*. Scaphopod: *Dentalium* sp. Kotada Bhadli being located fairly inland, the accumulation of these marine estuarine molluscs had resulted mainly due to human related activities such as subsistence and to a certain degree shell working.

Identification of Shell net sinkers

Of interest among the small excavated shell finds are the columellae of the large marine gastropod *Turbinella pyrum* and one perforated bivalve shell which were identified as net sinkers (Table 1). The *T. pyrum* columellae were identified due to the presence of a notch or a groove around which a string could be tied to weigh down a fishing net or a line. While a complete valve of *Anadara* sp. with a crude perforation in the umbo and slightly abraded ventral margin had also been used in the similar way. For more confirmation of their function as net sinkers, comparisons with examples drawn from archaeological and ethnographic literature was attempted.

The fishing activities of the Harappans are well attested from the recovery of copper fish hooks, fish skeletal remains and depictions of nets and fish on ceramics,

Table 1: Archaeological context of the shell net sinkers identified at Kotada Bhadli.

No	Trench	Layer	Room	Species	Length mm	Description
63	unknown	3	4	*T. pyrum*	52.95	Smooth groove around centre
	XE5	3	10	*T. pyrum*	59.76	Notch on either side
363	XD2	unknown		*T. pyrum*	65.92	Smooth groove around centre
255	XC3	unknown		*T. pyrum*	69.64	Smooth groove around centre
235	XG2	unknown		*T. pyrum*	47.21	Smooth groove around centre
767	XB5	3		*T. pyrum*	64.19	Notch on either side
379	unknown	unknown		*T. pyrum*	20.31	Notch on either side
64D	XO3	Starting depth 3.21m, end depth 4.65m		*Anadara* sp.	56.81	Perforated umbo

Fig. 4: Perforated *Olivas* p. from Kotada Bhadli.

Fig. 5: Worked *Turbinella pyrum* columellae as net sinker

however, the reporting of net sinkers is limited. The Harappans used both terracotta and stone net sinkers, with the latter more common. Two types of net sinkers are identified: a) hollowed/annular bead shaped, and b) perforated ring shaped. Both types were found at Mohenjodaro, Chanhudaro, Kalibangan and Lothal (Ghosh, 1990; Agarwal, 2006). No net sinkers are reported from Harappa. At Mohenjo-daro, a grooved net sinker made from limestone was found (Marshall, 1931). Due to the lack of systematic identification of net sinkers from stone and terracotta objects, and detailed studies regarding their function, it is difficult to understand their use by the Harappans. To a certain extent, ethnographic observations on present-day fishing practices in the Indian subcontinent have helped in the reconstruction of past fishing techniques and equipment used (Hornell, 1950; Sarkar, 1954; Belcher, 1994; Ruikar, 2013). Today, along the Gujarat coast, net sinkers made of perforated miliolite rocks, stone, cement and lead are commonly used (personal observation; Ruikar, 2013).

The *Turbinella pyrum* columellae from Kotada Bhadli share very little similarity with the Harappan net sinkers recorded so far, except for the grooved one from Mohenjo-daro and one *T. pyrum* columella illustrated in the Surkotada excavation report (Joshi, 1990). Since no ethnographic parallels for them were available from this region, these were identified from their resemblance to several examples of small pecked stones identified as net sinkers at archaeological sites world over. In general, any grooved, notched or perforated stone weight that was used to weigh down a fishing net or line is interpreted as a net sinker or net weight.

Use of notched pebbles as net sinkers for fishing lines and nets is reported from North-West America (Rau, 1884). However, some of the earliest net sinkers are the double-notched pebbles made of limestone and basalt recovered from in situ context at Ohalo II (Sea of Galilee, Jordan Valley), radiometrically dated to 19,500 yrs BP (Nadel and Zaidner, 2006). Identification of net sinkers used in freshwater fishing was carried out from a notched pebble assemblage found at the Neolithic site of Beisamoun, in the Hula Valley, northern Israel (Rosenberg *et al*., 2016).

At Al Ubaid in Iraq, Wooley (2006) had identified the grooved pebbles as net sinkers. Use of similar weights were depicted on fishing nets in ancient Egypt (Brewer and Friedman, 1989). Stone pebbles having a pecked shallow groove along their waistline facilitating the attachment of lines were commonly used as net sinkers from early 5th to 4th millennium BC along the Oman coast at sites like Saruq and Akab (Uerpmann and Uerpmann, 2003; Beech, 2003; Charpentier and Mery, 2008). Large stone net sinkers with pecked waste lines are also reported from the 3rd millennium settlement of Umm an Nar in UAE (Beech, 2003).

The *T.pyrum* columellae from Kotada Bhadli are similar to these stone net sinkers due to the presence of the notch or the groove in the centre. Selection of *Turbinella pyrum* columella as net sinkers was probably due to its hard compact nature, weight, and as an easily available raw material. In Gujarat during the Harappan period the large-scale shell working resulted in numerous columella being discarded as debitage, which could be used for the purpose of net sinkers. By procuring these isolated columellae, the net sinkers were produced locally as they required simple techniques of manufacture. This included abrading the external grooves to achieve a cylindrical object with a smooth surface. A shallow notch was made on either side of the waist of the columella, or a groove around its breadth using a chisel, by which it could be fastened to the end of a fishing net or a line (Fig. 6).

Fig. 6: A broken *Turbinella pyrum* shell and a worked columella.

Anadara shell net sinker

A similar function as a net sinker could be also applied to the single valve of *Anadara* sp. measuring 56.81 mm in length. Its umbo has an irregular, crude perforation suggesting that it was made by gouging or percussion using a sharp pointed tool, and not by drilling. The perforation was probably used for tying the shell to a fishing net or fastening a line as a net sinker. The ventral margin is slightly abraded, suggesting it could have also served as a scraper (Fig. 7). Being a large and heavy shell, its use as a bead or pendant is doubtful. It was probably brought for dietary purpose as *Anadara* shell fragments have been recorded along with it, and then used after meat extraction. While it was a commonly eaten mollusc at certain coastal Harappan sites like Kuntasi, Shikarpur and Bagasra (Deshpande-Mukherjee 1998; 2015), a few similarly perforated *Anadara* shells were observed only at Khirsara, a Mature Harappan site located close to Kotada Bhadli. Here too these may have served the same purpose as net sinkers (personal observation). In modern times along the Indian east coast *Anadara* sp. are collected for its meat and its shells used for lime extraction, but rarely as net sinkers (Alagarswami and Narasimham, 1973; Rao, 1974). In order to identify the perforated *Anadara* shell as a net sinker, similar examples were sourced from ethnographic and archaeological

Fig. 7: Perforated *Andara* shell as net sinker

literature which provided ample evidence for this particular aspect. *Anadara* shells, commonly referred to as ark shells, are a common component of shell middens along the coast of Oman (Biagi, 1994), in Australia (Bailey *etal*., 1994) and of Lapita sites in Oceania (Poulsen, 1987), and have been attributed to various roles such as representing food refuse, as tools (shell scrapers), net sinkers and recently as a game. The most common interpretation of these shells, with their umbo perforated, were as net sinkers (Poulsen, 1987). Often these interpretations were based on ethnographic parallels such as those documented in Tonga and New Caledonia (Gifford and Shutler, 1956). Spennemann's (1993) review of *Anadara* shell use in the Pacific indicates that *Anadara* valves were ethnographically employed as net weights, alongside other uses such as vegetable scrapers, paring knives, coconut-grater heads etc. However, Connaughton *et al*. (2010) provided an alternate function for perforated *Anadara* shells previously identified as net sinkers, suggesting that the shells are to be associated with Taupita, a game played in

Tonga, which involved smashing the umbos off shells with other shells.

A more convincing identification could be the close similarity observed between the Kotada Bhadli specimen and the almost complete *Anadara* shell, perforated on its umbo and identified as net weight, from the water logged site on Marco island, Florida, currently on display in the Key Marco collection Florida Museum of Natural History at the University of Florida.

Conclusion

To conclude, an attempt to identify the function of the grooved *T.pyrum* columella and perforated *Anadara* shell from Kotada Bhadli, was a difficult task due to their limited occurrence and paucity of similar finds from other sites for comparison. Hence, this makes them unique as a rarely reported object of the Harappan civilisation. Their identification as net sinkers was based on the parallels drawn from archaeological and ethnographic records, mostly from outside the Indian subcontinent. These shell net sinkers in a way represent minor objects made using simple techniques similar to those used on prehistoric stone artefacts. This is in contrast to the high degree of technological advancement the Harappans had made in relation to metallurgy, shell working and lapidary etc. Their presence therefore suggests that shell working was not only geared for the manufacture of bangles, beads and inlays using complex techniques, but also of simple objects having a utilitarian function for certain sections of the Harappan society. In this case, most likely the fisher folk residing at Kotada Bhadli, which is identified as a rural settlement. While an attempt was made to identify their function as net sinkers, it is still not clear how and what type of fishery they were used for. It is suggested that these objects were probably used in throwing nets, or at the end of fishing lines. Kotada Bhadli, being located fairly inland from the Kachchh coast might have engaged in fishing from a riverine source close to the site. Currently the site is located at the confluence of two streams. It is intriguing as to why these columellar net sinkers have not been found at other sites so far. One probable explanation could be that they were not always brought back to the settlement post fishing, unlike copper fish hooks which were more valued. Considering the limited number of objects examined, a more detailed concise study of net sinkers from various other Harappan sites in the future would further our understanding of their functional aspects, or even negate their role as net sinkers.

References

Alagarswami, K. and K.A. Narasimham. 1973. Clam, cockle and oyster resources of the seas around India. Proc. Symp. Living Resources of the Seas around India. CMFRI,Cochin. 648-658.

Agarwal, S.C. 2006. History of Indian fisheries. Daya publishing house New Delhi.

Bailey, G., Chappell J. and Cribb, R. 1994. The Origin of "Anadara" Shell Mounds at Weipa, North Queensland, *Australia Archaeology in Oceania, Vol. 29, No. 2 , pp. 69-80*.

Beech, M. 2003. The development of fishing in the UAE: zooaracheological perspective in Arcaheology in the United Arab Emirates (Daniel T. Potts, Hasan Al Naboodah, Peter Hellyer) Trident Press.

Belcher, W.R. 1994. Multiple approaches to the reconstruction of fishing technology: net-making and the Indus Valley Tradition. In *From Sumer to Melluha: Contributions to the Archaeology of West and South Asia in Memory of George F. Dales, (J.M. Kenoyer, ed.)*, pp.129-140. Wisconsin Archaeological Reports 3. Madison, Wisconsin, USA.

Biagi, P. 1994. A radiocarbon chronology for the aceramic shell-middens of coastal Oman. Arabian Archaeology and *Epigraphy 5: 17-31*.

Brewer and Friedman. 1989. Fish and Fishing in Ancient Egypt. The Natural History of Egypt Vol.II. Warminster: Aris and Phillips.

Charpentier, V. and S. Mery 2008. A Neolithic settlement near the strait of Hormuz, Akab Island, United Arab Emirates in *Proceeding of the Seminar on Arabian Studies 38: 83-102*.

Connaughton, S.P., Karine Taché, and D. V. Burley 2010 Taupita: A 3000-Year-Old Shell Game in the Lapita Cultural Complex of Tonga. *Journal of Social Archaeology 10(1): 118-137.*

Deshpande-Mukherjee, A. and V. Shinde. 2014. Evaluating the role of Molluscan Shells recovered from Padri a Coastal Harappan settlement in Gujarat, India. In *Archaeomalacology: Shells in the Archaeological Record. Proceedings of the 11th ICAZ International Conference. Paris - Archaeomalacology Working group, 23-28 August 2010, France* (SZABÓ K., DUPONT C., DIMITRIJEVIC V., GASTÉLUM GÓMEZ L. G., SERRAND N., (eds.), 19-31. -, BAR International Series 2666. Archaeopress, Oxford, ISBN 978 1 4073 1308 5.

Deshpande-Mukherjee, A. 2015. Packaged food from the sea: Dietary use of Marine Molluscs at coastal Harappan settlements in Gujarat, India in *Recent Researches on Indus Civilisation and Maritime Archaeology in India* (Gaur, A.S. and Sundaresh ed.), pp.75-86. New Delhi: Agam Kala Prakashan.

Deshpande-Mukherjee, A., Sengupta, S. and Nath, J. 2014. The Molluscan Shell Assemblage from Khirsara: Evidence for another Harappan Shell Working Settlement in Gujarat. Heritage: *Journal of Multidisciplinary Studies in Archaeology 2 (2014): 23-40*.

Deshpande Mukherjee, A. 1998. Shell fishing and Shell craft Activities during the Harappan period in Gujarat. *Man and Environment Vol XXXIII (1): 63-81.*

Deshpande, A. 1996.Shell Remains, in *Kuntasi, A Harappan Emporium on West Coast* (M.K. Dhavalikar, M.R. Raval and

Y.M. Chitalwala eds.), Deccan College Post-Graduate and Research Institute, Pune.

Ghosh A. 1990. *An Encyclopaedia of Indian Archaeology*. EJ Brill, Leiden.

Gifford, E.W. and R. Shutler, Jr. 1956. *Archaeological Excavations in New Caledonia*. Anthropological Records Vol. 18, No.1. Berkeley: University of California Press.

Hornell, J. 1950. Fishing in many waters. Cambridge University Press, United Kingdom.

Joshi, J.P. 1990. *Excavations at Surkotada 1971-72 and Explorations in Kutch* (Ed.), New Delhi: Archaeological Survey of India.

Kenoyer, J. 1984. Shell working industries of the Indus Valley Civilisation: A summary. *Paleorient 10 (1):49-63*.

Marshall, J. 1931. Mohenjo-daro and the Indus Valley Civilisation Vol.I. London. Probsthain.

Nadel, D. and Zaidner, Y. 2002. Upper Pleistocene and Mid-Holocene Net Sinkers From the Sea of Galilee, Israel. *Journal of The Israel Prehistoric Society 32: 49-71.*

Poulsen, J. 1987. A Contribution to the Prehistory of the Tongan Islands. PhD dissertation,Australia National University, Canberra.

Rau, C. 1884*, Prehistoric Fishing in Europe and North America*. Smithsonian Institution, Washington D.C, p.380.

Rao, K.S. 1974. Edible bivalves: mussels and oysters. In: R. V. Nair and K.S. Rao (Eds.) *Commercial Molluscs of India*. Bull. Cent. Mar. Fish. Res. Inst., 25: 4-39.

Rosenberg, D.1, M. Agnon 1, D. Kaufman 2016. Conventions in fresh water fishing in the prehistoric southern Levant: The evidence from the study of Neolithic Beisamoun notched pebbles. *Journal of Lithic Studies vol. 3, nr. 3, p. 457-478*.

Ruikar, T. 2013. Harappan Net Sinkers in Saurashtra, Gujarat: An Ethnoarchaeological Perspective: *Puratattva 43: 232-238.*

Ruikar, T.R., Shirwalkar, P. Rawat, Y.S. andNaik, S. 2013. A preliminary study of the beads from Harappan site of Kotada Bhadli, Kachchh, Gujarat. *Heritage Journal of Multidisciplinary studies in Archaeology Vol.1: 486-499*.

Shirwalkar, P. and Rawat. Y.S. 2012. Excavations at Kotada Bhadli, district Kachchh Gujarat: A Preliminary report. *Puratattva 42: 182-201.*

Shirvalkar, P. 2014. Preliminary report of excavations at Kotada Bhadli, Gujarat: 2010-11. *Bulletin of the Deccan College Post-Graduate and Research Institute. Volume 72-73:55-78.*

Spennemann, D.H.R. 1993. Ark Shell Netsinkers: Fact or Fiction. *Archaeology in New Zealand 36: 75–83*.

Uerpmannn, M.1992.Structuring the late stone age of southeastern Arabia. *Arabian archaeology and epigraphy 3: 65-109*.

Uerpmann, H.P and Uerpmann, M. 2003. Stone age sites and their natural environment: The capital area of northern Oman part III: Beihefte Zum Tubinger Atlas des Vorderens Orients Reihe A (Naturwissenchaften) Nr 313 WiesBaden.

Wooley, L. 2006. *Excavations at Ur*. London. Keegan Paul Limited.

Abstracts

Paper Abstracts

Challenges for microwear analysis of figurative shell ornaments from pre-Colonial Venezuela

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Published in Journal of Archaeological Science: Reports, 11, pp.115-130, 2017

Abstract

Figurative ornaments displaying biomorphic and geometric designs have often been recovered from pre-Colonial sites in the Caribbean and northern South America. Such artefacts are held in museum and private collections, but often have not been the focus of systematic research. On the other hand, recent research into ornaments worldwide has focused on simple beads and automorphic shell ornaments. In this article, microwear analysis is used to assess technologies of production and use-wear of figurative shell ornaments from north-central Venezuela. It is our goal to reflect on the challenges posed by such collections, in terms of reproducibility of traces through experiments, post-depositional and curatorial modifications, and the complexity of past attachment configurations. The underlying question is how to deal with the limitations posed by the very nature of the studied collection in terms of preservation and of the high skill required in the reproduction of figurative artefacts.

Assessing the Nutritional Value of Freshwater Mussels on the Western Snake River

Johnson, J.W. and Plew, M.G. 2016.

Published in Journal of Northwest Anthropology 50 (1): 53-65

Shell remains from two mollusk species *Gonidea angulata* and *Margaritifera falcata* are commonly found in

archaeological sites along the western Snake River. There have been, however, no attempts to assess their nutritional value and dietary role. To further understand the role of mussels within prehistoric diets, the nutritional values of these species were compared with the values of other resources commonly found in riverine settings in southwest Idaho. Though the caloric value of mussels is relatively insignificant, these species do contain important levels of iron, carbohydrates, calcium, vitamin A, and ascorbic acid. A discussion of the life history of these species provides for consideration of possible seasonal use of mussels during the late winter and spring as a valuable source of nutrition during a time when other resources were scarce. Of particular note is the increase in protein, glycogen and sugars during this time as well as the presence of polyamine compounds which have implications for use of mussel's antioxidant and anti-inflammatory characteristics or as a seasonal appetite suppressant.

Conference Abstracts

Changes in Holocene Climate and Freshwater Mussel Species Composition at an Archaeological Site on the Tennessee River in Northeast Alabama

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Paper presented at the Freshwater Mollusk Conservation Society Biennial Symposium 2017, Cleveland OH

Pollution, habitat loss and other historic human impacts on lakes and streams have caused major changes in the species compositions of freshwater mussel communities in North America. Shell samples from stratified archaeological sites can provide baseline profiles of prehistoric species composition, and also document long-term changes in mussel communities in response to natural and/or anthropogenic causes. The Widows Creek archaeological site (1JA305) is a prehistoric Native American shell midden located on the right bank of the Tennessee River in northeast Alabama (TRKm 657). Excavations recovered thousands of mussel shells from Late Archaic (ca. 4000-5000 Cal BP), Early Woodland (2100-2400 Cal BP), and Late Woodland (1000-1250 Cal BP) components at the site.

Fifty-three species are represented in a sample of nearly 60,000 identified valves, most of which are now extinct, endangered, threatened, or of special concern. Mussels likely were obtained by foraging in the shallow, gravelly shoals of the nearby Widows Bar section of the river, and most were processed and consumed as a food resource. Leading dominant species include the Spike (*Elliptio dilatata*, 28%), the Dromedary Pearlymussel (*Dromus dromas*, 24%), and the Mucket (*Actinonaias ligamentina*; 8%). There is a significant negative correlation in the relative abundances of *E. dilatata* and *D. dromas* in excavation units associated with specific cultural periods ($R^2 = 0.54$; $p < 0.001$). *E. dilatata* predominates (30-48%) in the Early Woodland and lower Late Woodland components, whereas *D. dromas* is most abundant (30-42%) in the Archaic and upper Late Woodland components. The transition from *E. dilatata* to *D. dromas* in the Late Woodland period probably occurred at about 1100 cal BP. These changes correlate with long-term hydroclimate data obtained from sediment cores along the Tennessee River (TRKm 546-747), and suggest that *D. dromas* predominated at Widows Creek during dry episodes whereas *E. dilatata* was most abundant during periods of greater moisture.

Call For Papers

Meeting on Archaeomalacology of Latin America / Latin American Congress on Malacology

Prirápolis, Uruguay

2 October 2017

In recent years, progress has been made in archaeomalacology, highlighting in Latin America as one of the antecedents the Symposium "Archeology and malacology: case studies, perspectives of analysis and methodological approaches", carried out within the framework of the First Argentine Congress of Malacology (2013). In Latin American there are works focused on the accumulation of shells along the coasts of both the Atlantic and Pacific oceans (eg, sambaquís in Brazil, concheros or conchales in Argentina and Chile), and others that emphasize shell artifacts in terms of its technological use, symbolic valuation and/or participation in inter-regional exchange networks, as the emblematic case of Spondylus. However, the development of archaeomalacology in Latin America is still in its infancy, which requires the creation of greater links between researchers in the social and natural sciences, for the consolidation of new transdisciplinary approaches that

contribute to the sustainable growth of the field of research.

The formal deadline for the abstracts is 30 August 2017. Coordinators: Sandra Gordillo, Sebastián Pastor and Andrés Gascue. Contact: gordillosan@yahoo.es. Please note that the meeting will be in Spanish.

Molluscan Forum – The Malacological Society of London

Flett Lecture Theatre, Natural History Museum, London

30 November 2017, 09:00 – 18:30

This informal, annual, and successful meeting is designed to bring together people starting their research on molluscs, to give them the opportunity to present and discuss their work and to compare notes on methods and problems. Attendance at the Molluscan Forum is open to all, but presenters should be research students, post-doctoral researchers, undergraduate students starting molluscan projects, and amateurs engaged in substantial projects that have not yet been published. Any topic related to molluscs is acceptable:

- Palaeontological
- Physiological
- Behavioural
- Ecological
- Systematic
- Morphological
- Cellular
- Molecular

Short talks (~15 min) or posters may be offered. They need not be polished accounts of completed work; descriptions of new methods, work in progress, and appeals for assistance with unsolved problems are equally acceptable. In addition to talks and posters there may be opportunities to acquire books and other items contributed by members of the Society. Lunch will be provided and The Forum will end with a wine reception, both sponsored by The Malacological Society of London. There is NO registration fee and a limited amount of help with travel costs will be available for presenters who cannot claim them from elsewhere.

Enquiries and registration form to Andreia Salvador, Curator of Marine Mollusca, Natural History Museum (a.salvador@nhm.ac.uk) before 15th October. Non-presenters: please let us know you will be coming so that we can estimate numbers.

Grand Challenge Agendas in Environmental Archaeology

Association for Environmental Archaeology Autumn Conference 2017

University of Edinburgh, Scotland

1 – 3 December 2017

Conference abstract

How do we approach today's great themes in international environmental archaeology? How will this feed into the next research agenda? What are environmental archaeology's grand challenges? 'Grand challenges for archaeology' have recently been proposed to focus the disciplines efforts and capabilities on the most important scientific challenges (Kintigh *et a*l. 2014, *PNAS* 111, 879-80). Those identified focus on investigating the dynamics of complex socio-ecological systems, addressing key questions of emergence, complexity, demography, mobility, identity, resilience, and human-environment interactions. Environmental archaeology is ideally situated to contribute directly to these challenges, concerned, as it is, with the human ecology of the past – the relationship between past human populations and their physical, biological and socio-economic environments – through the analysis and interpretation of animal and plant remains within the depositional environment of the archaeological site and its surroundings. These approaches allow analysis of the dynamics of socio-ecological systems at varying spatial and temporal scales. Combined with the continued advancement of scientific methodological applications this is enabling increasingly powerful insights into human paleoecology, for example via analyses of palaeodiets, disease ecology, and past climatic change. Particular challenges lie in how to integrate data generated from diverse methodological approaches, and how to model and test cultural and ecological agency in the past, and how to tap the full potential that lies in increasingly large and disparate datasets being generated by the different practitioners of environmental archaeology. Public and fiscal responsibility also challenges environmental archaeological research to contribute to debates of relevance to the modern world, with its important potential insights on human-environment interactions, biodiversity, food security, and societal resilience.

This conference seeks to explore the grand challenge agendas for environmental archaeology that confront its methods, approaches, contributions and relevance, including (but not limited to):

- the ways in which the discipline can contribute to the major research foci of archaeology

- advances in method, and integration of methods, that are permitting more robust and nuanced insights in these areas
- approaches to modelling and testing past socio-ecological relationships, and exploring issues of cause and effect in these systems
- the ways in which environmental archaeological research is relevant and contributes to the contemporary world

The organising committee invites oral and poster presentations that examine these themes. We are particularly keen to encourage comparative research that show how regional case studies can make essential contributions to globally-important questions, or indeed help to shape them and set new agendas for research.

Please send proposals for papers and posters to AEA2017@ed.ac.uk by Friday 29 September 2017. Abstracts should be sent as Word documents, be a maximum of 200 words and contain a clear description of the topic. Please include a title, complete name(s) of author(s), affiliation(s), and full postal and email addresses.

Prehistoric Personal Adornment in Social and Economic Context

XVIIIe world UISPP Congress - Exploring the world's prehistory

Quartier latin, Paris, France

4 – 9 June 2018

Session abstract: Artifacts of personal adornment are intimately connected to issues of identity, wealth, status, value, and exchange and can offer unique insights into the organization and practices of prehistoric societies. Evidence that has been uncovered in the last twenty years has substantially altered the timeline for the emergence of symbolic behavior and also shown that instead of a sudden emergence, personal adornment has a complex and mosaic prehistory marked at certain times and places by intensified investment. The conditions that motivate investment in symbolic material culture are complex and varied, and untangling them is crucial to understanding the centrality of symbolic practice to the form and function of human societies. In order to gain a more comprehensive and nuanced understanding of the factors that have influenced investment in personal adornment over time and space, this session will focus on contexts of ornament production and use across prehistory, from the hunter-gatherer bands of the Pleistocene to early pastoral and farming societies, without geographic restriction. We invite papers that go beyond typology to examine the broader social, technological, and economic contexts of the production and use of articles of personal adornment. Specifically, contributions will focus on the relationships between personal adornment and: technology, raw-material economy, demography, mobility, landscape use, subsistence patterns, wealth, exchange, cultural transmission, production organization, and/or social organization more broadly. The primary focus of the session is beads and pendants in biogenic materials (tooth, shell, ivory, bone, antler, amber, ostrich eggshell), but we invite contributions based on other materials related to adornment such as stones and minerals, metals, pigments, and perishable materials such as hide, sinew, and hair.

The abstract submission process opens on June 1st and will close on November 30th, 2017. Information about the organization of the meeting is available at the UISPP website: https://uispp2018.sciencesconf.org/.

Conferences and Events

Session 310: Scientific approaches to the study of ornaments: from the archaeologist's toolkit to body adornment in the past

European Association of Archaeologists Annual Meeting 2017

Maastricht, Netherlands

31 August 2017, 14:00 – 18:15, MECC Room 1.12

Abstract

Ornamentation of the body is recurrent across different societies and time periods. It generally takes a variety of forms: from objects added to the bodies of people to modifications of the body itself. Body ornamentation is often connected to group identity and cosmology; in addition, ornaments and their exotic raw materials have been circulated through long-distance exchanges. Extensive variability is seen in terms of ornament types, raw materials, and attachment systems. In face of this cross-cultural and long-term importance, alongside material variability, a broad range of instruments of analysis has been used for studying archaeological bodily ornaments, especially beads. In the last 20 years, different scientific approaches have emerged, including optical microscopy at different magnifications, SEM imaging and SEM-EDS, µ-CT scanning, XRF, morphometrics, etc. Focus has been placed on one or several of ornaments' traits: raw material characteri-

zation and sourcing, morphology, technologies of drilling, carving and grinding, use and its duration, and material preservation. An important concern has been the use of non- or minor destructive analytical techniques. The present session invites papers concerned with the use of scientific approaches to the study of ornaments of different raw materials, such as stones, minerals, shell, bone, teeth, and metal. Focus on one or multiple aspects of ornament biographies are both welcomed. We also encourage a reflection on the different toolkits available for their study and the methodological choices that guided analysis. It is the final aim of the session to discuss the differences, advantages and shortcomings of selected methods of analysis.

Organizers: Catarina Guzzo Falci[1], Kinga Winnicka[2], and Annelou Van Gijn[1]

[1] Leiden University

[2] University of Wrocław

Website: http://www.eaa2017maastricht.nl/en

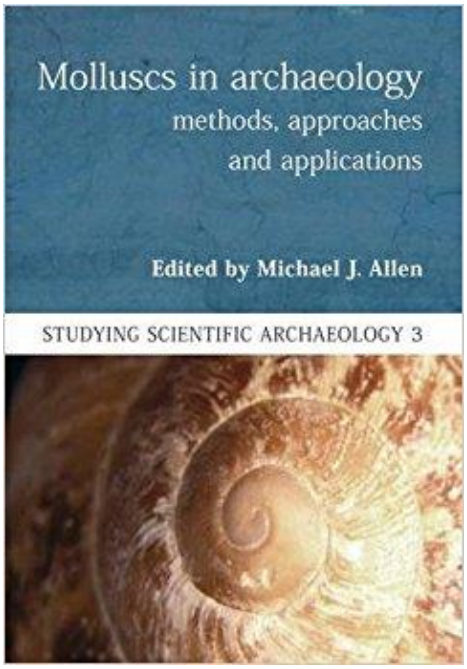
Paper submission closed.

Recent Publications

Books

Allen, M.J. (ed.) 2017. Molluscs in Archaeology: Methods, Approaches and Applications

Oxbow Books, Studying Scientific Archaeology, Volume 3 (ISBN: 9781785706080)



- A new overview of a key topic for archaeologists, palaeo-ecologists, and anyone who is studying environmental archaeology
- A broad-based text book which concentrates on accessible analysis most archaeologists and students can undertake and understand
- Edited and with chapters by Mike Allen, a leading environmental archaeologist and land snail expert

The subject of 'Molluscs in Archaeology' has not been dealt with collectively for several decades. This new volume in Oxbow's Studying Scientific Archaeology series addresses many aspects of molluscs in archaeology. It will give the reader an overview of the whole topic; methods of analysis and approaches to interpretation. It aims to be a broad-based text book giving readers an insight into how to apply analysis to different present and past landscapes, and how to interpret those landscapes.

It includes marine, freshwater and land snail studies, and examines topics such as diet, economy, climate, environment and land-use, isotopes, and molluscs as artefacts. It aims to provide archaeologists and students with the first port of call giving them a) methods and principles, and b) the potential information molluscs can provide. It concentrates on analysis and interpretation most archaeologists and students can undertake and understand, and reviews the 'heavier' science in terms of potential, application and interpretational value.

Papers

Der Sarkissian, C., Pichereau, V., Dupont, C., Ilsøe, P.C., Perrigault, M., Butler, P., Chauvaud, L., Eiríksson, J., Scourse, J., Paillard, C. and Orlando, L., 2017. Ancient DNA analysis identifies marine mollusc shells as new metagenomic archives of the past. *Molecular Ecology Resources* DOI: 10.1111/1755-0998.12679.

Dupont C., Hinguant S., Merle D., 2017 - Diversité des territoires d'origine des parures en coquillage mésolithiques de la grotte Rochefort (Saint-Pierre-sur-Erve, Mayenne). *Bulletin de la Société Préhistorique Française. Tome 114, numéro 1, janvier-mars 2017, 7-23*.

Johnson, J.W. and Plew, M.G. 2016. Assessing the Nutritional Value of Freshwater Mussels on the Western Snake River. *Journal of Northwest Anthropology* 50 (1): 53-65.

Marquardt, W.H. and Kozuch, L., 2016. The lightning whelk: An enduring icon of Southeastern North American Spirituality. *Journal of Anthropological Archaeology, 42, pp. 1-26*.

Reese, D.S. 2016. The Invertebrates. In: Hallager, E., and Hallager, B.P. (eds). *The Greek-Swedish Excavations at the Agia Aikaterini Square, Kastelli, Khania, 1970-1987, 2001, 2005, and 2008 V The Late Minoan IIIA:1 and II Settlements*. Stockholm: Skrifter utgivna av Svenska Institutet i Athen, 4o, XLVII:V:1, 396-417.

Reese, D.S. 2016. Shell from the Grotta Scaloria. In: Elster, E.S., Isetti, E., Robb, J., and Traverso, A. (eds). *Archaeology of Grotta Scaloria: Ritual in Neolithic Southeast Italy*. Monumenta Archaeologica 38. Los Angeles: The Cotsen Institute of Archaeology Press, UCLA, 358-368.

Reese, D.S. 2016. The Marine Shells. In: Preston Day, L., *et al*. *Kavousi IIC The Late Minoan IIIC Settlement at Vronda: Specialist Reports and Analyses*. Prehistory Monographs 52. Philadelphia: INSTAP Academic Press, 178-180.

Reese, D.S. 2016. Marine Shells from Kef Zoura D and Aïn Misteheyia (Algeria). In: Lubell, E. (ed). *Holocene Prehistory in the Télijène Basin, Eastern Algeria. Capsian Occupations at Kef Zoura D and Aïn Misteheyia*. Oxford: Archaeopress, 135-139.

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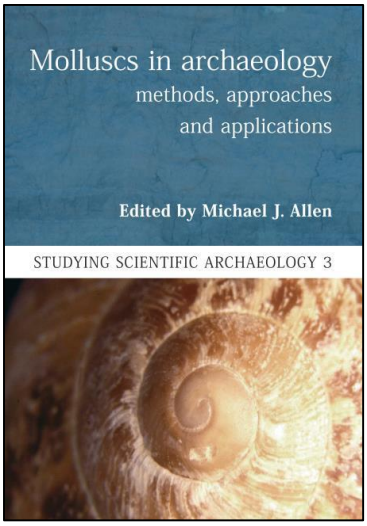

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